DOCUMENT RESUME

ED 169 526 CS 004 804

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TITLE A Processing Activities Approach to Memory for Prose.
PUB DATE 78
NOTE 15p.; Paper presented at the Annual Meeting of the American Psychological Association (86th, Toronto, Canada, August 1978)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Advance Organizers; Connected Discourse; Higher Education; Learning Processes; *Memory; Prose; *Reading Processes; Reading Rate; *Reading Research; *Recall (Psychological); *Retention; Semantics; Surface Structure; Syntax

ABSTRACT

In an analysis of a processing activities model of memory applied to connected discourse, 206 college students assigned to eight conditions in two studies evidenced significantly greater recall when provided with semantic level tasks than either surface feature analysis or reading control (intentional and incidental) conditions. Additionally, tentative support was provided for a hierarchy of processing activities for prose learning, especially when logical or evaluative tasks were compared with advanced organizers, review statements, or interspersed inferential-level questions. (Author)

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A PROCESSING ACTIVITIES APPROACH TO MEMORY FOR PROSE

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In an analysis of a processing activities model of memory applied to connected discourse, 206 subjects in two studies, assigned to eight conditions, evidenced significantly greater recall when provided with semantic level tasks than either surface feature analysis or reading control (intentional and incidental) conditions. Additionally, tentative support was provided for a hierarchy of processing activities for prose learning, especially when logical or evaluative tasks are compared with advanced organizers, review statements or interspersed inferential level questions.

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A recent characterization of human memory has as a basic premise that retention is a direct function of the total context of to-be-remembered events. As suggested by Jenkins (1974a), a leading proponent of the contextualist approach, ". . . *what memory is depends on context*. . . (p.786, italics in the original)." In other words, memory for the contextualist is a fluid, continually modified construct which depends for its psychological definition on the ability of the definer to identify relevant aspects of the total context.

Jenkins and his associates (Hyde & Jenkins, 1969; Hyde, 1973; Johnson & Jenkins, 1971; Walsh & Jenkins, 1973), have extensively explored context in terms of processes involved in comprehension and recall of information. The initial series of studies (summarized in Jenkins, 1974a; 1974b) assessed the effects of varying "comprehension" activities on retention levels and clustering effects in free recall. The "Jenkins Paradigm" consisted of variations in contextual "sets" for processing materials. Activities devised to establish these sets ranged from requiring subject attention to surface features of an array to tasks requiring semantic level processing.

A typical experiment involved the oral presentation of words or sentences to subjects. Following presentation of each stimulus item, subjects were routinely asked to perform a specific operation on the word or sentence, attending to either orthographic, syntactic or semantic features of the array (e.g., rating whether a particular item contained the letter 'e'; indicating the part of speech or a word in the presentation; or rating a particular word or phrase for pleasantness/unpleas-

antness or activity/passivity).

Results obtained following this basic procedure indicated that performance of subjects induced to process items to a semantic level not only surpassed lexical or syntactic task groups, but equalled or exceeded performance of subjects exhorted to learn the materials and informed of a subsequent free recall test. In an extensive review of these procedures and outcomes, Jenkins (1974b) contends that semantic level orienting tasks, ". . . are quite powerful in 'setting the switches' with respect to the kind of experience that a word will provide to a subject. . . (p.13)."

The present studies were intended to begin the assessment of a processing activities approach to memory; or more specifically, to determine the effects of orienting tasks on relatively short term retention for meaningful discourse. Since the findings of Jenkins and his associates (1974a; 1974b) appeared so robust, generalization of a processing activities approach to more complex informational arrays seemed appropriate.

A second major intent of the present inquiry was to determine whether or not a hierarchy of semantic level processing tasks exists within the analogue proposed (Jenkins, 1974a; Craik & Tulving, 1975; Saltz, 1971; Klein & Saltz, 1976). For example, are all semantic level tasks or operations equally facilitative, or are some types of tasks more efficacious for encoding than others?

As a final consideration for these studies, research from a variety of theoretic perspectives has attempted to ascertain the impact of specific tasks or operations on reading speed and subsequent retention

for processed materials. McConkie, Rayner & Wilson (1972), Morasky & Willcox (1970) and Craik & Tulving (1975) have discussed the extent to which subjects can modify reading (or processing) rates as a function of text difficulty, type of task, intention, level of topical knowledge, etc. Tasks requiring semantic elaboration and interpretation by previously acquired knowledge structures will perforce require greater amounts of processing time, with an hypothesized increase in retention. The tasks constructed for the present study vary in terms of processing requirements, allowing for a test of the temporal hypothesis of Craik & Tulving (1975).

Method

Two hundred and six undergraduate students participated in two studies (94 in Study 1; 112 in Study 2). Participants encountered specially designed prose passages describing characteristics of a ficticious nation. Each passage consisted of a superordinate (topic) sentence and three subordinate (specific) level statements. The design of both studies encompassed eight conditions, with variations in processing tasks comprising the major independent variable manipulation. Study 1 employed a recognition measure and Study 2 a cued recall test as dependent variables. Task groups differed as follows:

1) Surface Feature Analysis Task. Subjects estimated a randomly determined number of spelling errors in each passage.
2) Incidental Reading Control. Subjects specifically attended to lexical features, and responded to a mask questionnaire.
3) Intentional Reading Control. Subjects, informed in advance of the post-test, simply read the passages.

4) Superordinate Question Task. Subjects responded to text interspersed superordinate level questions.

5) Superordinate Statement Review Task. Subjects evaluated the suitability of superordinate statements, following suborindate level passages, as aides in memorizing subordinate information, and responded to a mask questionnaire.

6) Superordinate Organizer Task. Subjects evaluated superordinate statements preceding the subordinate passages as aids in memorizing subordinate information, and responded to a mask questionnaire.

7) Semantic Evaluation Task. Subjects rated. on a Likert scale, the helpfulness of each superordinate statement in understanding the subordinate level paragraphy.

8) Logical Evaluation Task. Subjects rated each superordinate statement as to whether it followed "logically" from each preceding subordinate level passage.

Modifications were made to 50% of the superordinate statements for groups seven and eight which rendered them false relative to the subordinate passages.

Procedure

Participants in both studies were tested in small groups of five to ten. Stimulus booklets, prepared for each condition, were randomly distributed as students entered the test site. An equal number of participants from each condition were assigned each session day, with booklet presentations counterbalanced for time of day. Instructions relevant to the various conditions were provided orally, and presented

again in the introduction to the booklets.

Experimental sessions were conducted in an educational psychology laboratory separate from distractions present in the building. Each student worked in semi-isolation, in individual study carrels. During the task assigned, all subjects had ready access to a large clock for timing passage reading speed. Actual post-testing took place in a separate room to preserve the unexpected nature of the test.

Both acquisition and text phases of the studies were intensively monitored, to answer any questions and to insure subject compliance with instructions, specifically the requirement that they refrain from returning to previously read passages.

Results and Discussion

Results of Study 1 (recognition test) indicated highly significant post-test differences across the eight conditions on total score, and subordinate/superordinate scores (see Table 1). Significant differences were indicated between Evaluation Task subjects and Surface Feature Task and Incidental Reading Control subjects. Differences in processing time obtained also supported a differential processing time hypothesis, with Evaluation Task subjects spending as much time as Surface Feature Task subjects and more than the other task condition subjects on time per passage.

Findings in Study 2 (Cued recall test) showed patterns of significance similar to those obtained in Study 1 on total score, subordinate/superordinate scores and processing time scores across study conditions (see Table 2). Congruent with Study 1 outcomes, the Evaluation Task

subjects, supporting a processing levels interpretation of prose memory.

Results from both studies supported the hypothesis that qualitative differences in encoding operations have marked effects on performance, depending on the type of assessment measures used. Orienting activities which induce semantic level processing facilitate retention of prose. This hypothesis was sustained by a significant disparity in performance between tasks which centered attention on surface features and those requiring attention to meaning.

Overall, results obtained in both studies tended to support the hypothesis that qualitative differences in encoding operations can have rather marked effects on performance, possibly depending on the type of assessment measures used. Orienting activities which induce semantic level processing appear to be of considerable efficacy for facilitating subject retention of prose. Of particular importance in this regard is the highly significant disparity in performance between tasks which center attention on surface features and those requiring attention to meaning. For both recognition and cued recall tests, 16 to 18 point differences were obtained between Surface Feature and Semantic or Logical Evaluation task groups.

These data parallel results obtained by Jenkins (1974a), utilizing orally presented words or sentences, and appear to sustain a contextual (processing activity) component in a prose memory model. Additionally, Jenkins' findings that subject performance under semantic level orienting tasks equalled or exceeded levels attained by subjects under instructions to learn was replicated in both studies. The data

are thus consonant with the hypothesis that it is the nature of the encoding event, not extra-organismic manipulations to the nominal stimuli, that is primarily responsible for retention. In other words, subjects do not remember what nominal stimuli were presented "out there," rather their retention of information is a function of what they acutally <u>did</u> while processing and encoding materials.

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Table 1

Study 1 - Means & Standard Deviations

Groups	Ns	Total Score		Subordinate Score		Superordinate Score		Time/Passage (secs)	
1) Logical Evaluation	11	52.64	6.50	24.82	4.56	27.82	2.82	23.36	4.10
2) Semantic Evaluation	12	52.92	5.63	23.92	3.17	29.00	3.10	26.17	6.67
3) Superordinate Organizer	14	47.93	8.78	20.86	4.77	27.07	4.60	18.29	5.82
4) Superordinate Review	12	43.33	10.10	18.25	4.37	25.08	6.30	17.92	3.73
5) Superordinate Question Task	11	42.45	9.11	19.27	5.65	23.18	4.04	15.30	1.89
6) Reading Control-Intentional	10	41.50	8.15	18.60	2.37	22.80	6.21	22.18	7.68
7) Reading Control-Incidental	10	36.80	9.99	17.00	4.35	19.80	6.08	15.50	6.75
8) Surface Feature Task	14	34.43	6.14	15.50	3.30	18.93	3.43	25.00	6.97

Table 2

Study 2 - Means & Standard Deviations

Groups	Ns	Total Score		Subordinate Score		Superordinate Score		Time/Passage (secs)	
1) Logical Evaluation	13	30.08	7.77	13.38	3.64	16.69	4.52	18.85	2.79
2) Semantic Evaluation	15	28.67	9.42	12.67	5.07	15.93	5.13	21.53	4.69
3) Superordinate Organizer	14	26.79	6.84	11.86	4.55	14.93	3.89	19.29	5.58
4) Superordinate Review	15	23.47	12.18	9.73	5.80	13.73	6.95	17.93	5.86
5) Superordinate Question Task	14	20.93	10.22	12.79	5.83	8.14	5.16	22.93	6.32
6) Reading Control-Intentional	14	24.21	8.75	11.36	5.15	12.86	3.74	15.50	2.71
7) Reading Control-Incidental	13	23.31	5.37	9.61	1.85	13.69	4.01	17.46	2.07
8) Surface Feature Task	14	14.14	8.48	6.07	3.22	8.07	5.74	24.21	6.47